

Roll No.

**22644**

**M. Tech. 2nd Semester (CSE) CBCS Scheme  
Examination – May, 2024**

**ALGORITHM DESIGN**

**Paper : MTCSE22C2**

*Time : Three hours ]*

*[ Maximum Marks : 100*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note : Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.*

1. Write short notes on the following :

- (a) What is Link List ? Explain various operation performed by Link List. 5
- (b) Explain the difference between greedy and dynamic programming. 5
- (c) Discuss Sum of subset problem using backtracking briefly. 5

- (d) Solve the following recurrence by using recursion tree. 5

$$T(n) = 2T(n/2) + n^2.$$

**UNIT – I**

2. (a) What is Divide and Conquer strategy ? Explain control abstraction for Divide & Conquer. 10
- (b) Write the algorithm of Binary Search tree with the help of example. 10
3. (a) Write short notes on : 10
- (i) Sets
- (ii) Operations on sets
- (iii) Algorithms for Union and Find Operation
- (b) What is the use of Stack and Queue in data structures ? Explain various operations performed by Stack and Queue in detail. 10

**UNIT – II**

4. (a) What is minimum spanning tree ? Explain Kruskal's Algorithm in details with the help of example. 10
- (b) Solve the below problem of Job Sequencing with Deadlines using Greedy method : 10
- $n=4$ ,  $(p_1, p_2, p_3, p_4) = (100, 10, 15, 27)$  and  $(d_1, d_2, d_3, d_4) = (2,1,2,1)$ .

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- ✓ 5. (a) Explain graph coloring problem with the help of dynamic programming. 10
- (b) What are Hamiltonian cycles? How Hamiltonian cycle problem can be solved using backtracking? 10

### UNIT – III

6. (a) What is NP hard graph and NP scheduling problems? Explain in detail. 10
- (b) Explain Node Cover Decision NP hard Problem also describe Flow Shop Scheduling problem of NP scheduling problem. 10
- ✓ 7. (a) Describe The Boyer-Moore algorithm for pattern searching in details. <https://www.mdustudy.com> 10
- (b) Describe The naive string-matching algorithm in detail with the help of example. 10

### UNIT – IV

- ✓ 8. (a) Explain  $\epsilon$ -approximations. Also solve bin packing problem with  $\epsilon$ -approximation. 10
- (b) Describe Parallel algorithms for finding connected components using linear algebra. 10

9. (a) What is difference between Fully Polynomial Time Approximations and Polynomial Time Approximation? Briefly Explain. 10
- (b) Write down the algorithm for Odd-Even Merge. Also explain Preparata's algorithm for sorting with algorithm. 10

<https://www.mdustudy.com>

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